

REMARKS

In the office action mailed July 1, 2005, Claims 1-13 and 27-42 were pending in the present application. The Examiner rejected all pending claims under 35 U.S.C. § 103(a) as allegedly obvious over Hibbard (U.S. Patent 5,454,844) in view of Homola (US 20040096705). By the present amendment, Claims 1, 4-5, 27, and 30-31 were amended. Claims 2-3 and 28-29 were canceled and the subject matter thereof incorporated into respective independent claims 1 and 27. In addition, Claims 43-45 were added. Therefore, Claims 1, 4-13, 27, and 30-45 remain pending in the present application. Further, it should be noted that such amendment has been made without conceding the correctness of the present rejections and without prejudice to Applicant's right to pursue withdrawn or relinquished subject matter in a future patent application, but solely for the purposes of expediting prosecution of the present application. Each rejection will be addressed in turn below.

Support for Amendments

No new matter has been introduced by the present amendment. The amendments to independent claims 1 and 27 can be found in originally filed claims 2-3 and 28-29, page 10, line 21, and page 12, line 14. Claims 4-5 and 30-31 were amended to change the dependency in light of cancellation of respective claims. Further, support for the amendments to Claims 5 and 31 can be found at page 11, lines 22-23 of the filed specification. Finally, support for new claims 43-45 can be found at page 13, lines 19-22 and page 16, lines 12-19.

Rejection Under 35 U.S.C. § 103(a)

Claims 1-13 and 27-42 were rejected as allegedly obvious over Hibbard in view of Homola. Applicant respectfully submits that the amended claims are patentable over the cited references for the reasons set forth below, and requests that the rejections be withdrawn.

Before discussing the § 103 rejections, it is thought proper to briefly state what is required to sustain such a rejection. The issue under § 103 is whether the PTO has stated a case of *prima facie* obviousness. “The PTO has the burden under § 103 to establish a *prima facie* case of obviousness.”

In re Fine, 837 F.2d 1071, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988). To satisfy this burden, the PTO must meet the criteria set out in M.P.E.P § 706.02(j):

. . . three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991).

With the above background in mind, the rejections under 35 U.S.C. § 103 will be discussed. Applicant contends that the cited references fail to make a *prima facie* case of obviousness in that the cited references fail to teach or suggest all of the claim limitations of Applicant's invention.

Specifically, Hibbard and Homola fail individually, and in combination, to disclose a fixed abrasive tool including a nanodiamond polishing layer having “a plurality of projections spaced apart at a projection loading ratio of from about 0.05 to about 0.5.” With respect to the above introduced phrase, the claimed invention requires that the projections be “spaced apart.” However, the cited references disclose nanodiamond slurries and fixed abrasive tools having abrasive composite features

which are “abutting” and closely spaced in order to achieve a “high areal density.” See col. 3, lines 28-34 and col. 5, lines 36-37. Not only does Hibbard require that the features are “abutting”, but Hibbard further states that “some physical contact is *required* between adjacent abrasive composites of the invention to facilitate providing a high areal density of the composites over the surface of the backing.” (emphasis added) Col. 5, lines 34-37. Thus, Hibbard and Homola fail to disclose spaced apart projections.

In this manner, Hibbard also teaches away from the claimed invention. Specifically, Hibbard directly teaches away from projections which are spaced apart to any degree by requiring abutting or physical contact. As additional distinction, amended claims 1 and 27 emphasize this point by claiming a loading ratio of 0.05 to 0.5. Thus, from about 0.95 to almost 0.5 of the substrate surface is exposed and not covered by projections. The abrasive composites of Hibbard having a high areal density would approach a loading ratio of 1.0, which is almost twice the high end claimed by the present invention. Accordingly, the present invention can perform ultrasmooth polishing using fewer projections without an increase in pits or scratching. Thus, spaced apart projections having nanodiamond particles such that a loading ratio of 0.05 to 0.5 is achieved would be contrary to conventional wisdom and thus indeed non-obvious, over the cited references.

With respect to new claims 43-44, the cited references fail to teach or suggest the claimed volume ranges of nanodiamond. Similarly, new claim 45 introduces an intermediate material which form chemical bonds between the nanodiamond particles and the organic matrix. Such intermediate materials are unconventional and can be used as coupling agents to increase the bonding of the nanodiamond within the tool matrix. Neither Hibbard nor Homola teach or suggest such

intermediate materials or coupling agents. As such, the new claims are also considered to be patentable over the cited references.

Accordingly, Applicant respectfully requests that the rejections be withdrawn and the pending claims be passed to issue.

CONCLUSION

In view of the foregoing, Applicant believes that presently pending Claims 1, 4-13, 27, and 30-45 present allowable subject matter and allowance is respectfully requested. If any impediment to the entry of this Amendment allowance of these claims remains after consideration of the above remarks, and such impediment could be removed during a telephone interview, the Examiner is invited to telephone Mr. Erik Ericksen, or in his absence, the undersigned attorney, at (801) 566-6633, so that such issues may be resolved as expeditiously as possible.

Please charge any additional fees except for Issue Fee or credit any overpayment to Deposit Account No. 20-0100.

Dated this 3rd day of October, 2005.

Respectfully submitted,

THORPE NORTH & WESTERN, LLP

A handwritten signature in black ink, appearing to read "David W. Osborne", with a long horizontal flourish extending to the right.

David W. Osborne
Reg. No. 44,989
8180 South 700 East, Suite 200
Sandy, UT 84070
Telephone: (801) 566-6633
Facsimile: (801) 566-0750